

Frankie

"Some Electrical Measurements of, Once of Mr. Edison's Horseshoe Lamps."
By Henry Morton, Ph.D., Alfred M. Nagge, Ph.D., and B. F. Thomas A.M., at Stevens Institute of Technology."

Sci. Amer., Feb. 17, 1880.

Resistance	Condition of Lamp
123 ohms	Cold
44 "	Orange light
83.7 ..	$\frac{9}{10}$ candle
79.4 ..	5 "
75 "	18 "

This was horizontal face candle-power.
Quote conclusions perhaps? But perhaps too indistinct.

Edison Bristol - board 8c.p. filament before carbonizing 0.07868 sq. inches, and after carbonizing 0.0423 sq. in.

16c.p. had face surface of 0.054 sq. in. after carbonizing. Thickness after carbonizing 0.00477

average c.p. on any meridian is 0.6366 of the sum of face and edge value in that meridian.

This was a Sawyer patent Edison's Pat. 317, 676

16c.p. filament 3 inches long after carbonizing

8c.p. filament 1.9 inches long after carbonizing

page 78.

much much "Plants" in 95 to established possible desired 110. "Wroughtage

until 1874.

changed life in

remains same of watt.

normal lamp was there there about 100 hours.

Ks. 6c.p. - about

100 volts - then carbon in lamps - in slaterooms and main saloons - Paper carbons - Pat. 317, 676.

Report to Sheldon, Oct. 20/702.
S.S. Columbia 3-100 v. generators, rated each at 60. 16c.p. lamps. Had a separate exciter. Lamps suspended from the wires, as were too fragile for rigid support.

rated by face c.p.

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"Some Electrical
Measurements of
One of Mr. Edison's
Horseshoe Lamps."

"By Henry Morton, Ph.D.,
Alfred M. Mager, Ph.D.,
and B. F. Thomas A. M.,
at Stevens Institute of
Technology."

Sci. Amer., Sept. 17, 1880.

Resistance	Condition
	6 Loop
123 ohms	Cold
84 "	Orange light
83.7 "	$\frac{9}{10}$ candle
79.8 "	5 "
75 "	18 "

This was horizontal
face candle-power.

Quote conclusions
perhaps? But perhaps
too invidious.

Edison bristled-
board 8c.p. fil-
ament before
carbonizing.
0.07868 sq. inches,
and after carbon-
izing 0.0423 sq.
in.

16c.p. had
face surface of
0.054 sq. in. after
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Thickness after
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average c.p. on
any meridian is
0.6366 of the sum
of face and edge
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meridian.

This was a Sawyer pat.
Edison's pat. 517, 836

16c.p. filament
3 inches long after
carbonizing

8c.p. filament
1.9 inches long after
carbonizing

Edison lamp factory
at Menlo, Oct. 1/80 to
May 1/82. W.S. Andrews,
in "Edisonia", page 163.

Edison lamp factory
at Menlo. First
regular payroll of
"Edison Lamp Co." was
Nov. 11, 1880. Moving
to Harrison commenced
April 1, 1882, which was
started June 1, 1882, with
150 hands employed.
W.V. Weeks, "Edisonia",
pp. 139-140.

Moving lamp factory to
Harrison began in Feb.,
1882, and mfg. began
there in April. Hist. Soc.
Lamp, Howell & Schroeder,
page 65.

Pictures of E.S.S. Columbia
and Hinds, Ketchem & Co.
page 63

Howell and Schroeder -
Hist. Incandescent Lamp, page 78.

Filaments (bamboo) varied much
in required voltage, as much
as 15 to 20 percent; so that "Plants"
operating all the way from 95 to
125 volts were thus established
all because it was impossible
to make all lamps of the desired
voltage which was 110."
This was due to diff. in shrinkage
or cutting inaccuracies.

Bamboo used by Edison until 1894.
Page 77.

Page 65. Lamps 8 per h.p. - changed
later in 1881 to 10 per h.p. - life in
both cases 600 hours.

Page 83. Lamps of 1881 gave 1.68 lumens
per watt. The carbon lamps of
1886 gave 3.4 lumens per watt.

Edisonia, page 103, "The normal
life of the paper horse shoe lamp was
about 300 hours, although there
were several instances of these
lamps remaining in use about
1000 hours."
H. J. Hammer.

Edisonia, page 133, H. V. Lunt.
S. S. Columbia. 115 lamps - 16 c.p. - about
100 volts - then called "A" lamps - in
storerooms and main saloons - Paper
carbons - Pat. 317,676.

Report to Shelton, Oct. 20/1902.
S. S. Columbia 3-100 v. generators,
rated each at 50. 16 c.p. lamps. Had
a separate exciter. Lamps suspended
from the wires, as were too fragile for
rigid support.

Note: This great
voltage variation
was in the earlier
1880's

[Resis. cold 123 Runs]

-114 Resis.
-111 amp.

114
114
114
12.654025 c.p. = 0
12.654
12.654
12.654
12.654
1404594 Wath

(1)

94R
361 C
94
564
282
33.934 V
361
33934
203604
2069974
101802
12.250174 W

(5)

82.5R
672 C
1650
5775
4950
55.4400 V
672
11088
38808
33264
37.25568 W

(10)

-112 R
-129 C
1008 c.p. fast visible
224
172
14448 V.
129
130032
28896
14448
1863792 W.

(2)

90R
445 C
40.050 V
445
20025
16020
16020
17.82225 W

(6)

80R
811 C
64.880 V
811
6488
6488
51904
52.61768 W

(11)

1646
111R
164 C
444
166
18.204 V
164
72816
109224
18204
2.985456 W

c.p. dull red

84.4R
578 C
6752
5908
4220
48.7832 V
578
3902656
3414824
2439160
28.1966896 W

(7)

77.6R
708 C
6208
6984
70.4608 V
708
5636864
6341772
63.784064 W

(12)

106R
239 C
954
318
212
25.334 V
239
228006
76002
50668
6.054826 W

(4)

c.p. cherry red

84 R
626 C
504
168
504
52.584 V
626
316004
3105168
316004
32.968084 W

(8)

74.5R
1.079 C
6705
5215
745
80.3855 V
1.079
7234695
5626985
803855
86.7359545 W

(13)

83.3R
645 C
4165
3332
4998
53.7285 V
645
2686425
2149140
3223710
34.6548825 W

(9)

By Prof. Norton's tests.

Volts	Ohms	Amperes	Watts	Maximum horizontal Candle Power
0	123	0	0	0
12.654	114	.111	1.405	0
14.448	112	.129	1.864	Just visible
18.204	111	.164	2.985	Dark red
25.334	106	.239	6.055	Cherry red
33.934	94	.361	12.250	.016
40.050	90	.445	17.822	0.10 .10
48.783	84.4	.578	28.197	0.50 .50
52.584	84	.626	32.968	0.83 .83
53.728	83.3	.645	34.655	1.10
55.440	82.5	.672	37.256	1.5
64.880	80	.811	52.618	4.5
70.461	77.6	.908	63.978	9.2
80.386	74.5	1.079	86.736	20.0

another set of readings gave (page 5):

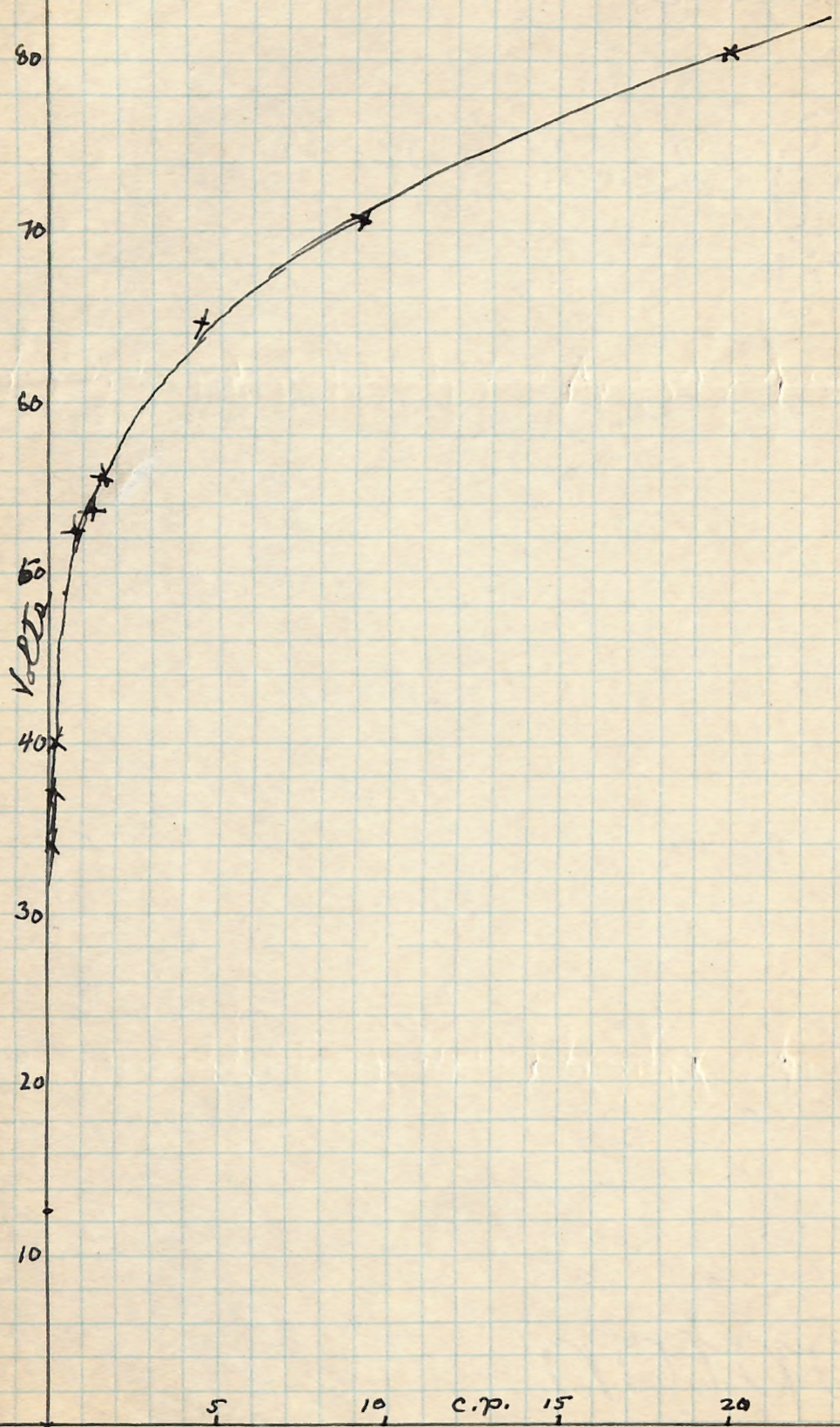
C.P.	Ohms
0	123 cold
0	113.5
Dark red	106
0.1	94
0.2	89
0.4	87
0.9	83.7
1.9	82
5.1	79.8
8.4	78
18.	75

Horizontal average C.P. = 69% of maximum
By measuring candle-power
with the lamp making angles
10° apart. See attached
two sets of horizontal
average candle-power
to 69% of maximum
face candle-power.

60
70
80
60
50
40
30
20
10

Volts

5 10 c.p. 15 20



Edison Horseshoe Lamp

The bulb was blown from 1 inch lead-glass tubing, which is the size of the bulb-neck. The stem through which the conducting wires were sealed and served to support the filament burner was made from $\frac{3}{8}$ inch tubing, and extends downward about $1\frac{3}{4}$ inches into the wooden stand. The total height of such lamps averaged about $6\frac{1}{4}$ inches from top of bulb-tip to lower end of stem.

An exact-size outline ^{illustration} ~~drawing~~ of the lamp was pub. ~~in~~ ⁱⁿ an article on "Edison's Electric Light" by Francis R. Upton, Scribner's Monthly, Feb., 1880. This article was authorized by Edison, and bears his indorsement.

Edison's first commercial
bristol-board "kerosene"
filament lamp.

